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ABSTRACT

This paper presents the educational implications of an empirical study aimed at establishing current attendance rates, identifying the factors that influence attendance, and understanding how important these factors are for different groups in the Malaysian population through simulations and projections. Part 1 introduces the design and development of the study for policy makers and its varying significant influences enabling the balance of objectives, costs, and priorities to improve education. Part 2 briefly describes the policy initiatives Malaysia has used to pursue its educational objectives and the trends in educational levels that influenced those objectives. Part 3 discusses the problems for assessing policy effects over the short term and briefly describes the study's data base and methodology. Part 4 presents the findings on attendance levels, the factors affecting them, and the effects that future policy initiatives could have on the major population groups. Six bar graphs are included. (TRS)

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Schooling Policy in Malaysia

Dennis De Tray

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Schooling Policy in Malaysia

Dennis De Tray

January 1985

Prepared for the
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PREFACE

The Agency for International Development has sponsored a series of Rand research projects to study the role of the family in economic development. Several of these projects have focused on education in Malaysia. This report presents the policy implications of an empirical study aimed at establishing current attendance rates, identifying the factors that influence attendance, and understanding how important these factors are for different groups in the Malaysian population. The technical results of that study are reported in Dennis De Tray, *Schooling in Malaysia: Historical Trends and Recent Enrollment*, The Rand Corporation, N-2011-AID, October 1984. These policy implications were first presented in a briefing given by the author at the Workshop on Human Resources and Economic Development. Jointly sponsored by the National Family Planning Board of Malaysia and The Rand Corporation, the workshop was held in Penang, Malaysia, in October 1982. This report was prepared from a transcript of the briefing.

Dr. De Tray was a senior economist at Rand when this report was prepared. He is currently Chief of the Living Standards Research Unit at the World Bank.

SUMMARY

As a result of government policies and economic growth, Malaysia has achieved almost universal primary schooling and rapidly rising secondary enrollments. Although all major subpopulations in the country have shared in this growth, some historical disparities remain. Attainment levels are still higher for urban than for rural people, for men than for women, and for Chinese than for Indians and Malays. Because educational parity has been a major policy objective, Malaysian policymakers are seeking policy alternatives that will overcome these disparities. This report demonstrates that knowing how Malaysian households respond to different family and community conditions may provide invaluable assistance in assessing the growth and distributional effects of those alternatives. The latter effects are especially important because if policies affect groups differently, they could widen instead of diminish disparities.

This policy study builds on an empirical analysis of schooling trends and recent enrollment in Malaysia. That analysis indicated that school attendance is heavily influenced by family income, school location, and availability of transportation. Using actual levels of Malayasian secondary-school attendance as the base case, the present study calculates what attendance levels would be if each of these family or community characteristics were changed, but all others remained the same. Simulations were made for each major subpopulation.

These simulations indicate that although economic growth--as reflected in family incomes--has done much to promote Malaysia's rapid growth in educational levels, rising incomes may have only marginal effects in the future. Consequently, school location and transportation show more promise as policy options. The simulations also show, however, that these options will not affect all subpopulations to the same degree.

Building secondary schools where none existed would improve attendance considerably for rural children, girls, and Malays. While it would also raise boys' attendance, it would affect girls much more. In

contrast, it would have virtually no effect on urban and Chinese enrollment. Improving transportation would raise attendance for rural children and boys almost as much as building schools would. It would also significantly increase Malay attendance relative to Chinese attendance, but it would have little effect on girls' or Indians' attendance.

An awareness of these differences not only will enable policymakers to assess the growth and distributional effects of the two policies, but also will help them identify policy options that have greater overall advantages. To illustrate, building schools and improving transportation have similar effects on attendance (except for girls and Indians). One might argue, however, that building a school serves only one purpose, while improving transportation might serve other national policy objectives as well. Consequently, the latter might be given higher policy priority.

This exercise in projection illustrates how these policy interventions might be studied and suggests how others might be approached. Before such projections could be used in policy decisions, more analysis would be needed--especially analysis of the relative costs of various interventions and how they would affect other national goals.

ACKNOWLEDGMENTS

Joyce Peterson adapted the text of this report from the transcript of an oral briefing. She did so under difficult circumstances and with minimal guidance. Both the substance and presentation of the report have benefited enormously from her efforts. I owe her a very large debt of gratitude.

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I. INTRODUCTION

Malaysia has a school system and a record of rising educational levels that are among the best in Third World countries. Government policies and investments in education have combined with a growing economy to produce almost universal primary schooling and rapidly rising secondary and postsecondary enrollments. Although all Malaysians have shared in this educational growth, recent statistics reveal that several important disparities remain among different subpopulations. Since educational parity is a major objective of government policy, Malaysian policymakers are concerned about the persistence of these disparities.

In their efforts to raise education levels further, policymakers face an array of policy options. Some of these options promise more certain results than others; some require more resources; and some may affect other policy goals in more or less predictable ways. This is obviously true for all nations, regardless of their relative development, but the choices are more than ordinarily complex for Malaysia's policymakers: If policies affect groups differently, they could widen instead of diminish the historical disparities.

Rand has undertaken several research projects designed to identify and understand the consequences of Malaysia's educational policies. Our empirical study of Malaysian school enrollment found that school attendance levels among Malaysian children respond to changes in family resources and in costs of attending school. It also found evidence that the government's policy decisions would have different effects on certain groups.[1] However, it did not develop the policy implications of that evidence; this report does, showing how factors such as family income, school location, and transportation influence all children's attendance, and, thus, completed education levels. It also establishes how significantly this influence varies among the groups of policy interest: urban and rural people, boys and girls, and the country's major ethnic groups--Malays, Chinese, and Indians.

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[1]Findings of this empirical study are reported in Dennis De Tray, *Schooling in Malaysia: Historical Trends and Recent Enrollment*, The Rand Corporation, N-2011-AID, April 1983.

Knowing the magnitude of these differences will allow Malaysian policymakers to balance objectives, costs, and priorities as they design policies to improve educational levels for all groups. Moreover, other developing countries also face disparities in education levels between rural and urban people and boys and girls. Consequently, our policy assessments may inform their education policy debates as well.

Section II briefly describes the policy initiatives Malaysia has used to pursue its educational objectives, and the trends in educational levels that influenced those objectives. Section III discusses the problems for assessing policy effects over the short term and briefly describes the study's data base and methodology. Section IV presents the findings on attendance levels, the factors affecting them, and the effects that future policy initiatives could have on the major population groups.

II. POLICIES AND TRENDS IN MALAYSIAN EDUCATION

COUNTRY SETTING

Originally a British colony, Malaysia received its independence in 1957. Its highly pluralistic society and considerable success as a developing country have generated many "natural" experiments from which much can be learned about the role of families in the development process.

Recent statistics place Malaysia's population at about 14.5 million, with roughly half of that figure Bahasa Malay, 35 percent Chinese, and 12 percent Indian. Population growth rates averaged 2.5 percent per year during the period 1960 to 1981 and are projected to drop to an average of 2.0 percent for the remainder of this century.[1]

Malaysians enjoyed a gross national product per capita of $1860 (U.S. dollars), placing it 57th among the 145 countries for which GNP figures are given in the World Bank's *World Tables*. Malaysia's growth story places it well within the ranks of the development success stories: GNP per capita increased an average of 5.1 percent per year between 1970 and 1981. Only 16 of 145 countries bettered that figure.[2]

Incomes, occupations, and geographic location vary greatly within ethnic groups, but the following is a reasonable summary of the principal characteristics of each ethnic group:

> Most Malays live in rural areas and engage in small holder agriculture and fisning; urban Malays generally work in the government bureaucracy, the armed forces and police, and the lower rungs of the manufacturing and service sectors. Most Chinese live in urban areas, where they dominate commerce; rural Chinese engage in tin mining and agriculture as small holders. Most Indians live in the rubber and palm oil estates; urban Indians are in the professions and services.[3]

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[1]World Bank, *World Development Report 1984*, Oxford University Press, New York, 1984.

[2]World Bank, *World Tables*, Vol. I, Johns Hopkins Press, Baltimore, Md., 1984.

Until 1961, Malaysia's school system mirrored the ethnic diversity of its population. Across the country, Malay, Chinese, and Indian children attended schools where classes were taught in their "native" tongues or in English. This meant that individual schools served culturally homogeneous student groups but that the educational system itself remained largely disunified. Moreover, attendance levels and quality of education varied widely. In 1961, the government began a series of policy actions to unify that system, to raise educational achievement, and to bring educational parity to all Malaysians.

These policies and other factors have required the government to commit considerable resources to education. The school-age population has grown; the educational system has spread; and the economic value of schooling has risen. Concomitantly, the demand for educational services has increased. The Malaysian government has strongly supported its policy commitment to education. As a fraction of GNP, school expenditures increased 20 percent between 1965 and 1976, from slightly more than $40 U.S. dollars to about $120 U.S. dollars per capita.[4]

HISTORICAL TRENDS IN EDUCATION

Figure 1 shows how growth in schooling has differed by ethnic group, sex, and time periods; it also underscores the ethnic inequities that concerned government policymakers. Men in the oldest cohorts would have begun school sometime between 1932 and 1942. Although World War II would have interrupted the education of some, Chinese men's schooling rose by about two and a half years, while Malay men added only about half a year during that time. In the postwar period, the average for Malays climbed considerably, but the gap between Chinese and Malay attainment remained fairly constant. However, with the youngest cohorts, growth in education seems to have levelled off more for Chinese than Malays, suggesting that the latter may be closing the gap. In

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[3]Kevin Young, Willem C. F. Bussink, and Parvez Hasan, *Malaysia: Growth and Equity in a Multiracial Society*, Johns Hopkins University Press, Baltimore, Md., 1980.

[4]See Donald R. Snodgrass, *Inequality and Economic Development in Malaysia*, Oxford University Press, New York, 1980, p. 249.

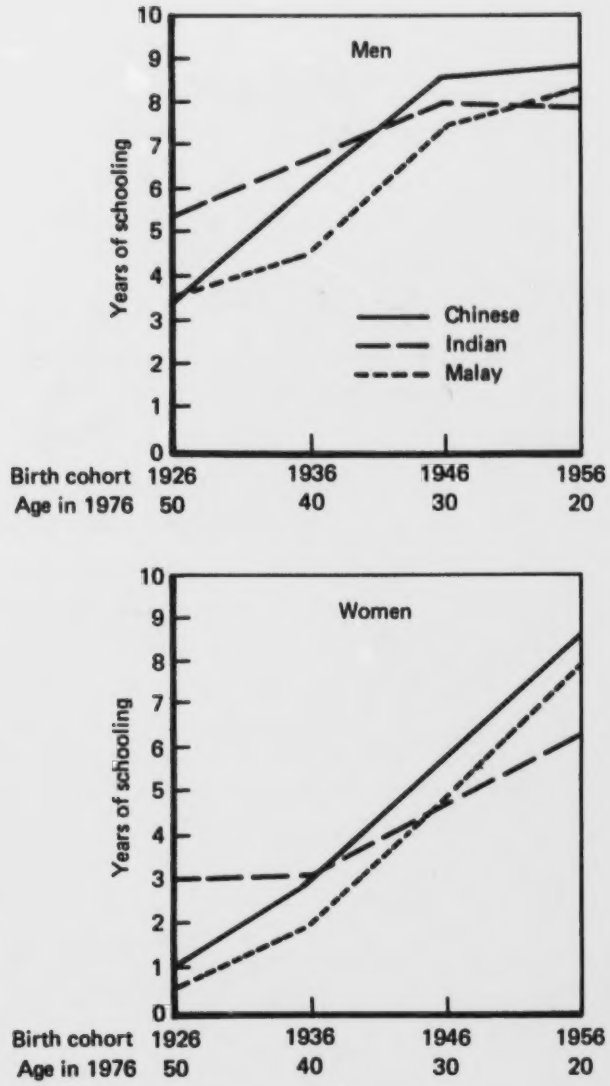

Fig. 1 -- Schooling trends by ethnic group and sex

contrast, Indian men have experienced the least rise in completed schooling, over the entire period, and have now fallen below both Chinese and Malays in educational achievement.[5]

[5]This worsening of the relative, and in some cases even the absolute, position of Malaysian Indians is evident in several studies in this series (see, for example, William Butz, Jean-Pierre Habicht, and Julie DaVanzo, *Improving Infant Nutrition, Health, and Survival,* The Rand Corporation, R-2924-AID, June 1981). These findings suggest that

As the figure indicates, women's schooling has increased much more dramatically than men's. Malay and Chinese women 20 to 40 years old have maintained remarkably constant growth rates, averaging over a quarter-year increase in schooling for each one-year increase in year of birth. While Indian women have not fared as well, their schooling rate has risen more rapidly than Indian men's in recent years.

In general, educational levels have risen for all three ethnic groups and for both sexes. Yet, these trends cannot reveal whether government policies and investments have been successful in accomplishing their objectives, or the extent of their success. The consequences of policies adopted since 1961 would be felt only by those who started school after the mid-1960s. In Fig. 1, only the very latest birth cohorts meet that criterion, and the policies would have had little time to affect them. To assess the effects of more recent changes in Malaysia's education policies, we need a research strategy other than one that analyzes trends in completed schooling.

Malaysia's Indian population will likely be of special concern to policymakers as new policies governing education and other social services are formulated.

III. THE RESEARCH STRATEGY, DATA, AND METHODOLOGY

THE RESEARCH PROBLEM

It may take 10 to 20 years to observe the full effects of a new policy initiative on average completed schooling levels. Policymakers obviously cannot wait that long to find out how a policy is working, but analyzing completed schooling levels prematurely may produce misleading results. If we look only at people who have completed their education, we ignore those who are still attending and who may go on to achieve above-average levels. This "censoring" of the schooling sample could mean that we would misrepresent the ultimate schooling levels of population subgroups.

There are two ways around this problem. First, we could design statistical models to deal with the censoring effect. Second, we could study leading indicators of future educational trends. A model of the first type is currently being developed at Rand.[1] In this study, however, we have used the second strategy and analyzed school attendance during the period 1976-1977. Attendance levels should respond to recent policy actions and foreshadow future changes in completed schooling.

Our empirical study identified factors that influence attendance and their importance for different subpopulations. In this report, we use that information to project how various policy options will affect these groups.

THE STUDY DATA

The Malaysian Family Life Survey (MFLS) proved ideal for these purposes because it provides information on children, their families, and the communities they live in. Conducted in three rounds during 1976-1977, the MFLS was based on a national probability sample of private households in Peninsular Malaysia that contained at least one

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[1]E. M. King and L. A. Lillard, *Determinants of Schooling Attainment and Enrollment Rates in the Philippines*, The Rand Corporation, N-1962-AID, April 1983. L. A. Lillard and E. M. King, *Methods for Analyzing Schooling Choice with Household Survey Data*, The Rand Corporation, N-1963-AID, July 1984.

ever-married woman younger than 50 years old. These households reside in 52 areas or primary sampling units (PSUs). On the family level, the survey collected comprehensive personal and socioeconomic information, including detailed data on schooling of all household members aged 5 and over. These data provided school attendance statistics for 1430 children who were 6 to 11 years old and 1436 who were 12 to 18 years old at the time of the survey.

Collection of community information was an unusual feature of the MFLS. For each PSU, the survey questioned community leaders (village heads, school principals, religious leaders, principal businessmen, etc.) about community characteristics and conditions, past and present. Facilities such as schools were among the topics covered. The community data provide information on educational problems, school location, and quality of transportation services. They are especially useful for our purposes for two reasons. First, because they were reported by community leaders instead of household respondents, they should have no built-in associations with school attendance, which might arise if families reported on them. Second, they relate to policy levers directly under the control of government agencies.

METHODOLOGY

Applying an appropriate statistical technique to this information, we made estimates of how changes in family and community characteristics influence school attendence.[2] Our estimates are based on a model in which the likelihood of a child's attending school at any point during the survey year depends partly on the child's age and sex, on parent characteristics (ages, education levels, income), and on school-related characteristics of the community. We estimated separate models for Malays, Chinese, and Indians, for urban and rural households, and for boys and girls.

[2]The estimates on which this analysis rests were based on a linear probit model to allow for the fact that the dependent variable--whether or not a child is in school--can take on values of only zero or one. Estimates were made in a multivariate context so that each coefficient represented the effect of a particular variable on school attendance, holding other variables constant. See De Tray, op. cit., for details.

To assess distributional effects, we used our empirical estimates to simulate the likely consequences of several policy options. For each simulation, the base case was the actual attendance level among children in the appropriate age range, for example, ages 12 through 18 for secondary school. We then calculated what attendance levels would be if one community or family characteristic were changed *but everything else remained the same*. For example, in one set of simulations, we assumed that family income would rise by a given percentage each year for the next decade. To determine how this rise in income was likely to affect school enrollment, we first increased each household's income by the required percentage, and then used our estimated equations to predict a new school attendance probability for each child, under the assumption that all other household and community characteristics remained unchanged.

We looked at the probable consequences of changes in certain key community characteristics using a similar methodology. For example, our estimated equations told us that secondary school attendance is particularly sensitive to whether the community has a secondary school within its boundaries. To get a sense of the effect of a school building program, we used our estimated equations to "build" a secondary school in communities that had none in 1976. If we assume that all communities have a secondary school, a comparison of actual attendance rates in 1976 with projected attendance rates reveals the overall effect of building schools and the distribution of that effect among Malaysian subpopulations.

We concentrated on four stratifications. Our baseline comparison looked at the effect of income growth for three deciles of the income distribution: the lowest, the middle, and the highest. We then looked at distributional effects of alternative educational policies among urban and rural households, among Chinese, Malays, and Indians, and among boys and girls.[3]

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[3]With the exception of the baseline income comparisons, our simulations are based on equations estimated only on the relevant subpopulation. For example, the simulations for rural households are based on an equation estimated only on rural households.

Our analysis of factors that have influenced recent attendance levels permits us to predict how various policy options would affect future levels. However, this exercise in projection is intended only to illustrate how policy interventions would affect the attendance of subpopulations; it is not intended as policy prescription. Before these projections could be used in any policy decisions, much more analysis would be needed, especially of the comparative costs of interventions and their effects on other government goals.

IV. DISTRIBUTIONAL IMPLICATIONS OF POLICY ALTERNATIVES

Even a cursory look at recent attendance levels suggests that the policy shifts of the 1960s and 1970s have influenced educational trends. Figure 2 shows that Malaysia's educational experience has changed in two ways that directed the focus of our analysis. First, school attendance differed in the past at the primary level among subgroups in the population. Now, primary schooling is virtually universal for Malays and Chinese, and nearly so for Indians. This means that future schooling trends will be determined by changes in secondary school attendance. Consequently, we focus our discussion of alternative education policies on secondary school attendance.

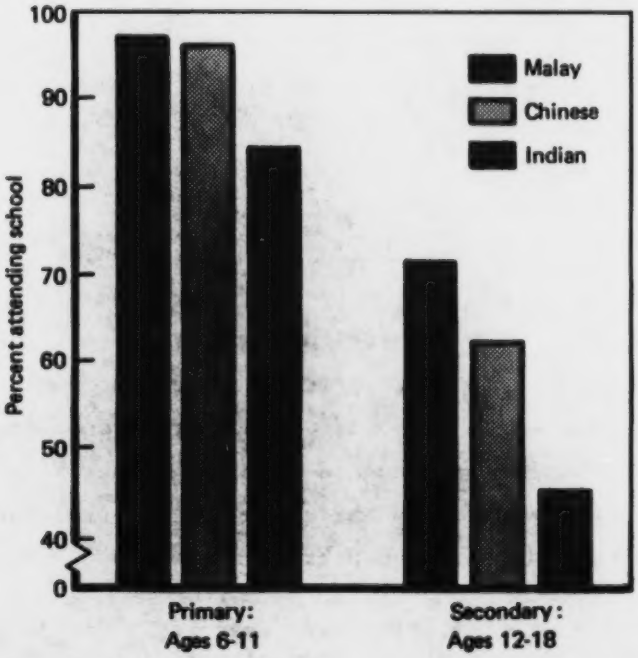

Fig. 2 -- School attendance rates in 1976 by ethnic group

Second, as the right-hand bars of Fig. 2 show, attendance rates in 1976 were higher for Malay 12-to-18-year-olds than for Chinese, and much higher than for Indians. If these relative positions hold, Malays should rapidly gain parity with Chinese in terms of *completed* schooling. If we consider the factors that influence school attendance, it appears that policy interventions, not circumstances, account for these departures from historical trends. As we shall see, lower income and lower parental education reduce the likelihood of attendance. Generally, Malays have lower incomes than Chinese, and Malay parents have lower education levels than Chinese parents. Yet, Malay attendance at the secondary level has surged well above Chinese. In effect, government policy has more than offset the lower economic and educational circumstances of Malay families.

Although past policies will continue to affect educational attainment, budgetary concerns and remaining disparities will force Malaysian policymakers to explore new policy directions in their effort to affect enrollment. In this section, we assess the distributional consequences of several policy options, given their effect on school enrollment for major subpopulations.

FACTORS AFFECTING ATTENDANCE

Our empirical analysis showed that Malaysian school attendance is influenced by family and community characteristics. On the family level, wealthier, better educated parents are more likely than poorer, less educated parents to send their children to school. Further, as is true in many Third World nations, the mother's schooling has far greater influence on children's attendance than the father's. On the community level, attendance is strongly influenced by the presence of a secondary school and the quality of transportation systems.[1] This last result

[1]Community characteristics were measured as follows: Presence of a secondary school means that the community (primary sampling unit) in which a household was located had at least one secondary school within its boundaries. Quality of transportation was determined by reports from community respondents; communities were divided into those with adequate or good transportation systems and those with poor transportation systems.

holds even if we consider *only rural* communities; it is not simply an urban/rural difference.

These findings come as no great surprise: One might well anticipate the direction of these effects. However, their magnitudes make a considerable difference for designing effective policy. Even more important, the study found strong differences in those magnitudes among population groups. These differences imply that alternative policies may not have uniform distributional effects for schooling attendance, in the short run, and for completed schooling, in the long run.

Effects of Economic Growth on Low, Middle, and Upper Income Groups

For a base-line policy option, the government would simply rely on economic growth to raise incomes and, thus, attendance. Figure 3 shows present attendance, which varies widely among the three income groups, and projected attendance over the next ten years if the Malaysian economy continues to grow by 4 percent per capita as it did during the first half of the 1970s.

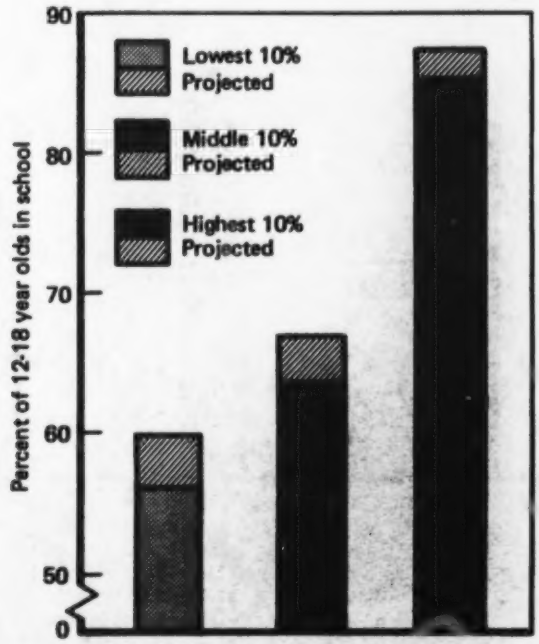

Fig. 3 -- Effects of income growth on secondary school attendance, by income group

The figure also suggests the shortcomings of this policy. A 4 percent per annum increase in income--an optimistic figure given the current economic climate--would raise attendance among the poor both absolutely and relative to the rich, but not by much. The lowest income group would still have barely 60 percent attendance rates. Since the relation between education and income is mutually reinforcing, attempts to raise both education and income among the poor will have to do more than rely on economic growth. Below, we compare the distributional effects that income growth, building new schools, and improving transportation would have on major subpopulations.

Effects on Rural and Urban Populations

As is true for most countries, school attendance is lower in rural than in urban Malaysia. The hatched areas in Fig. 4 show that while more than 70 percent of urban 12-to-18-year-olds are in school, less than 60 percent of their rural counterparts are. What would happen to these two groups under our three policy options?

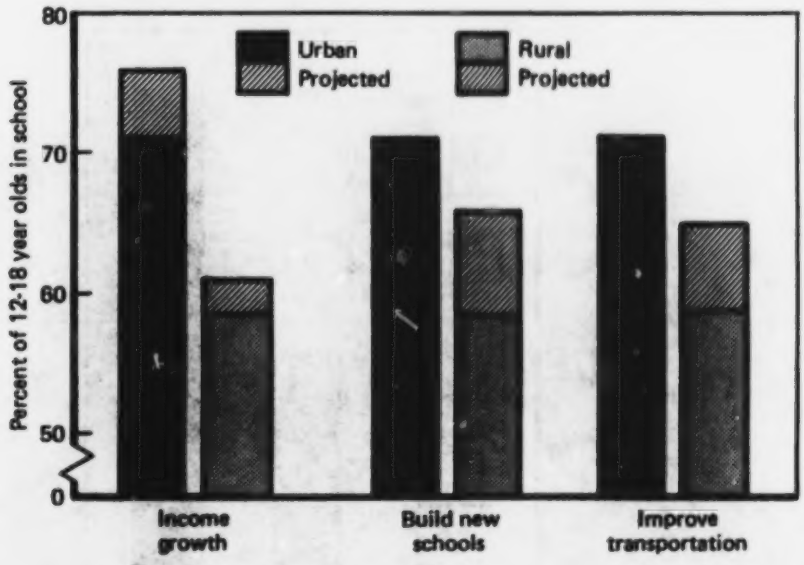

Fig. 4 -- Effects of policy alternatives on urban and rural secondary school attendance

- *Income growth*. With a 4 percent growth in income over ten years, both rural and urban attendance rise, but, somewhat surprisingly, urban attendance rises more.

- *Building schools*. By building schools in areas that do not have them, the government would increase rural attendance by almost 10 percentage points, but urban attendance hardly at all.

- *Improving transportation*. Not surprisingly, improving transportation would have an effect similar to building schools--that is, the government makes it easier to bring children to the schools rather than bringing schools to the children. Our results show that improving transportation would narrow the gap between rural and urban attendance almost as much as building new schools would.

In part, these results reflect the distribution of existing public resources in Malaysia. Almost all urban residents are within two miles of a secondary school, and most live within a mile. Fewer than 30 percent of rural residents are within a mile, and 30 percent are more than four miles away from a secondary school. In short, urban families have easy access to schools but most rural families do not. Thus, a policy that affected income alone would actually widen the gap between urban and rural attendance, while building schools (or improving transportation) would narrow that gap to around 5 percentage points.

Effects on Boys' and Girls' Attendance

Figure 5 shows that Malaysian girls' school attendance is only about 4 percentage points lower than boys'. This difference compares very favorably with that in other parts of the world, but it suggests that the growth in women's schooling that we saw in Fig. 1 may be losing its momentum. Under the circumstances, our three policy options would, again, have mixed effects:

- *Income growth*. This option would have a much greater effect on girls' than on boys' attendance. Both would increase, but if income grew at 4 percent for 10 years--and nothing else changed--girls' attendance levels would actually surpass boys'.

- *Building schools*. Although this option would not raise girls' attendance as much as income growth would, it almost closes the attendance gap between girls and boys. It has about the same effect on boys' attendance that income growth has.

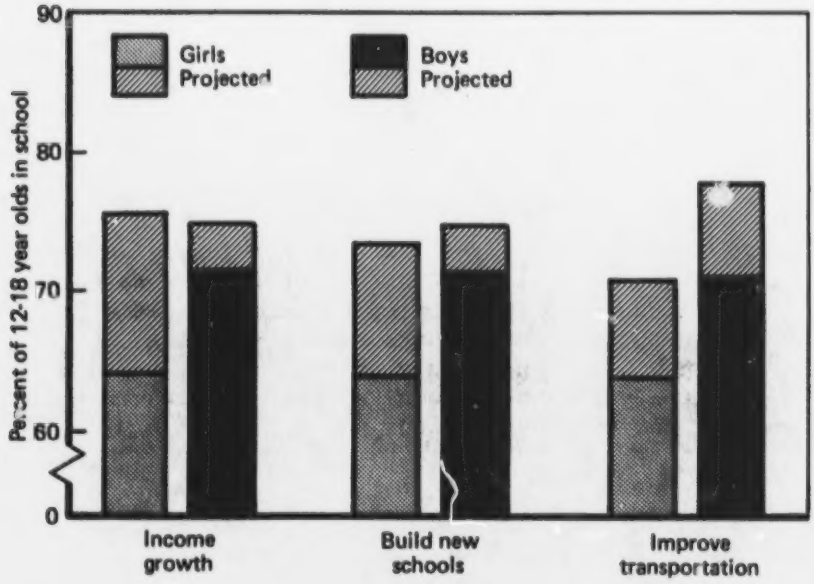

Fig. 5 -- Effects of policy alternatives on girls' and boys' school attendance

- *Improving transportation*. This option has a greater effect on boys' education than the other two and would effectively maintain the gap between male and female attendance.

If the Malaysian economy continues to grow, the prospects for women's schooling appear very bright. Among the study's strongest findings was that girls' attendance is much more sensitive than boys' to family income levels and to presence of schools in the community. It might be said that Malaysian families evidently consider schooling for boys a necessity, but for girls a luxury. This means that demand for boys' schooling is less responsive and demand for girls' schooling more responsive to policy change. Consequently, girls benefit most from rising income and decreasing costs of schooling (e.g., when a school is built in the community). However, improving transportation may have less effect on girls' schooling because Malaysian parents are reluctant to send girl children to distant schools no matter how good transportation facilities are.

Effects on Major Ethnic Groups

Malaysia's government has tried to balance a desire for educational achievement and unification with the constraints of a highly pluralistic society. However, as the 1976 attendance figures show (Fig. 2), Malays, Chinese, and Indians have not benefited equally from overall educational growth. Malay secondary attendance has topped 70 percent, while Chinese stands at about 62 percent--and Indian attendance has reached only about 45 percent. The projections in Fig. 6 indicate how critically future educational parity among the ethnic groups will depend on the policy options that government chooses.

- *Income growth*. Attendance would rise for all groups with income growth, but Indian families would benefit considerably more than Malays or Chinese. The 4 percent annual growth in income would raise Indian children's attendance by nearly 10 percentage points. However, it would still fall considerably below attendance for the other groups.

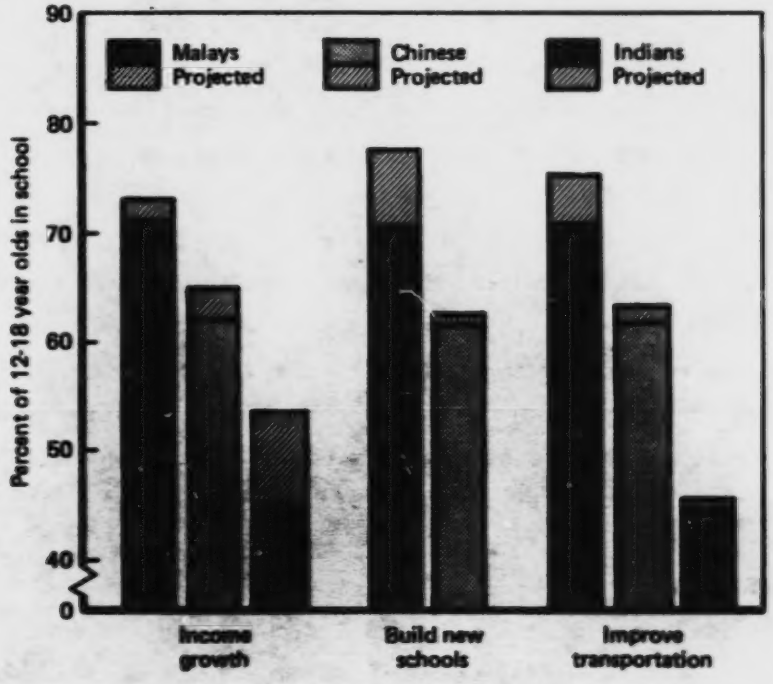

Fig. 6 -- Effects of policy alternatives on secondary school attendance, by ethnic group

- *Building schools*. Building secondary schools in communities without them would have a significant effect on the relative ethnic rates of school attendance, at least between Chinese and Malays, with Malays benefiting much more. (We explain below why we have no results for Indians on this policy.)

- *Improving transportation*. As Fig. 6 shows, in this instance, improving transportation is a fair substitute for building schools, but only for Malays and Chinese. It would have very little effect on Indian children's attendance levels.

These results reflect the different socioeconomic characteristics of Malaysia's ethnic groups. For the most part, they are consistent with the results for income and rural/urban groups: Because more Malays than Chinese live in rural areas, access to schools is more important relative to income for Malays than for Chinese.

The Indian figures for building schools are missing because we were not able to sort out the effect of having a secondary school in a community from the overall effect of living in rural communities. This was so because 93 percent of rural Indians lived in communities with no secondary schools. The 17 rural Indian families who did live in communities with secondary schools did not, in a statistical sense, provide enough information to estimate the separate effects of secondary schools and of living in a rural community. Rather than report a wholly ambiguous result, we omitted a bar for Indians in Fig. 6. However, it is true that rural Indian children who live in communities without secondary schools are much less likely to attend school than urban Indian children are (by about 30 percentage points). We also found the effects of transportation on Indian enrollments puzzling and open to interpretation. The effect may be minimal because the distance to schools is so great that transportation becomes irrelevant.

CONCLUSIONS

Malaysia has long demonstrated its commitment to education. In this report, we assume Malaysia's commitment will continue but that, given the percentage of GNP now devoted to education, budgetary decisions will receive increasing scrutiny. Under the circumstances, a careful analysis of how Malaysian households actually respond to

different family and community conditions could help policymakers considerably in choosing among policy alternatives.

Through a series of simulations, we have been able to show how school enrollment is likely to change in the future. Although economic growth probably contributed significantly to Malaysia's rapid rise in educational attainment,[2] our analysis shows that, in the absence of other changes, rising incomes may have only marginal effects in the future. If the Malaysian government is to raise secondary school attendance as it has raised primary school attendance, it must make direct policy interventions.

Two options for such intervention are (1) building secondary schools in more communities, and (2) improving transportation facilities, given the present distribution of secondary schools. However, our simulations show that these options do not affect all important subpopulations in Malaysia similarly. Their relative effects differ for urban and rural residents, boys and girls, and Chinese, Indians, and Malays. Awareness of these differences will allow Malaysian policymakers to assess both the growth and the distributional implications of policy alternatives.

This type of analysis can also help policymakers identify policy alternatives that have the greatest relative advantages all around. As we have seen, for all groups except girls and Indians, school attendance would be about equally affected by the building of a new school or the improvement of transportation facilities. However, if one option were significantly less expensive than the other, or one served more policy goals than the other, we would have a solid, objective basis for choosing between them. In this case, building a school serves only one goal, but improving the transportation infrastructure serves many. Recognizing the effects of improved transportation on school attendance should place transportation projects much higher on the policy priority ladder than would otherwise be the case. However, these considerations would have to be tempered by the relative costs of these alternatives.

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[2]See James Smith, *Income and Growth in Malaysia*, The Rand Corporation, R-2941-AID, 1984.

As we emphasized before, the analysis presented here is not intended to make policy prescriptions. Rather, it suggests where Malaysian policymakers can begin in making informed choices among the policy options considered. It cannot make those choices, but it can flag potential effects that deserve special scrutiny.